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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,401	10/20/2003	Benjamin Jay Diamant	60963-0015	5943
24341 7590 05/18/2007 MORGAN, LEWIS & BOCKIUS, LLP. 2 PALO ALTO SQUARE 3000 EL CAMINO REAL PALO ALTO, CA 94306			EXAMINER TRUONG, CAM Y T	
			ART UNIT 2162	PAPER NUMBER
			MAIL DATE 05/18/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/690,401

Applicant(s)

DIAMENT, BENJAMIN JAY

Examiner

Cam Y T. Truong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 09 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,13,15-18,25,27-30 and 37-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,13,15-18,25,27-30 and 37-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/9/2006.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. Applicant has amended claims 1, 3-6, 13, 15-18, 25, 27-30, canceled claims 2, 7-12, 14, 19-24, 26, 31-36 and added claims 37-48 in the amendment filed on 10/9/2006.

Claims 1, 3-6, 13, 15-18, 25, 27-30 and added claims 37-48 are pending in this Office Action.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1, 3-6, 13, 15-18, 25, 27-30 and added claims 37-48 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argued that claims 1, 3-6, 13-18 and 37-48 are statutory because claim 1 is a method which yields the results of identification of "one or more documents containing numbers that satisfy the expression".

In response to applicant argument, limitation "to identify one or more documents containing numbers that satisfy the expression" is a purpose and it 's not a concrete, useful, and tangible result.

Applicant argued that claims 37-48 are statutory. However, claims recite "a search engine" as a software thus the claims lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, functional descriptive material *per se*.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1, 3-6, 13, 15-18, 25, 27-30, and 37-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recited phrase "in the expression includes information indicative of an integral portion of a logarithm of the boundary number" in claims 1, 13 and 37 was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1, 3-6, 13-18 and 37-48 are rejected under 35 U.S.C.101 because the claimed invention is directed to non-statutory subject matter, specifically, as directed to an abstract idea.

The claims 1, 3- 6 and 37-40 are rejected as falling under the judicial exception of an abstract idea which lacks a useful, concrete, and tangible result. A claimed series of steps or acts that do not result in a useful, concrete, and tangible result are not statutory within the meaning of 35 USC 101. In the instant case, the claims recite, “[receiving]\_,” “[generating]\_,” and “\_\_[searching]\_.” However, no useful, concrete, and tangible result is claimed. For example, “writing said data,” “updating said data,” “sending said data” being claimed at the end of the claim may comprise a useful, concrete, and tangible result. Absent such a result, however, the claims are not statutory.

As regarding claims 25-30 and 45-48, “a search engine for querying number-range searches”, The claims lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, functional descriptive material *per se*.

Descriptive material can be characterized as either “functional descriptive material” or “nonfunctional descriptive material.” Both types of “descriptive material” are nonstatu-

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tory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994)

Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer.").

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 3-4, 6, 13, 15, 16, 18, 25, 27-28, 30, 38, 40, 42, 44, 46, 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda (US 2003/0225779) in view of Burrows (US 5915251).

As to claims 1 and 13, Matsuda teaches the claimed limitations:

“receiving a number-range search query having a number range, wherein the number range includes a boundary number” as processing a query have a condition of price >10. 10 is represented as one boundary number (paragraph [0047]);

“generating an expression of numerical index terms based on the boundary number” as transforming query to an equivalence search using an inverted index generated, e.g., the exemplary query is simple query having a single search condition. For two numbers N and M, their tokens  $N_i$  and  $M_i$ , if  $N.M$  there exists, by definition, a token  $N_j$  which is greater than  $M_j$ . In this case, the transformed query has an index entry that includes attribute, token, list). The transformed query is based on number 10 (paragraph [0047, 0048, 0049], page 4, col. Right, lines 49-52),

“wherein at least one numerical index term includes information associated with an indexed number” as each index entry includes each token associated with an indexed number, e.g., token 0001 is associated with index 5 (page 4, col. Right, lines 49-52; fig. 5);

“searching a document index using the expression to identify one or more document containing indexed numbered that satisfy the expression” as returning to the search condition, document Ids are retrieved from each matching token index which results in an ID list of all documents that match those tokens (paragraph [0052]).

Matsuda does not explicitly teach the claimed limitation "wherein a respective numerical index term in the expression includes information indicative of an integral portion of a logarithm of the boundary number".

Burrows teaches the range "57-70" can be converted to a Boolean search for the range-based metawords in the desired range. That is, search the word entries corresponding the subintervals whose concatenation exactly spans the range of the search term. If the selected metawords which exactly span the range are minimized, then the search time is also minimized since a minimum number of index stream readers need to be used. The metawords which are to be used for scanning the index are selected from the "bottom" level up. For example, the metawords 57.sub.-- 1, 58.sub.-- 2, 60.sub.-- 3, 64.sub.-- 3, 68.sub.-- 2, and 70.sub.-- 1 exactly span the range "57-70" as shown by the cross hashing (col. 26, lines 1-25).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply the range "57-70" can be converted to a Boolean search for the range-based metawords in the desired range. That is, search the word entries corresponding the subintervals whose concatenation exactly spans the range of the search term. If the selected metawords which exactly span the range are minimized, then the search time is also minimized since a minimum number of index stream readers need to be used. The metawords which are to be used for scanning the index are selected from the "bottom" level up. For example, the metawords 57.sub.-- 1, 58.sub.-- 2, 60.sub.-- 3, 64.sub.-- 3, 68.sub.-- 2, and 70.sub.-- 1 exactly span the range "57-70" as shown by the cross hashing to Matsuda's system in order to process



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a query having multiple ranges more efficiently and further reduce processing time by eliminating unnecessary physical accesses of the data while executing of the query and further order to identify locations of the records including portions of numeric information within the span of the range of values.

As to claims 3, 15, 27, Matsuda teaches the claimed limitation “wherein at least one numerical index term in the expression includes information indicating that a specified digit is the last non-zero digit of a respective number” as (fig. 5, page 4, col. Right, lines 49-52, paragraph [0042]).

As to claims 4, 16, 28, Matsuda teaches the claimed limitation “wherein at least one numerical index term in the expression includes information indicative of the sign of a respective number” as (fig. 5, page 4, col. Right, lines 49-52, paragraph [0042]).

As to claims 6, 18 and 30, Matsuda does not explicitly teach the claimed limitation “wherein the expression includes a plurality of numerical index terms that each correspond to a single respective digit of a respective number”. Burrows teaches index terms that corresponding to a digit of a range number (fig. 7, col. 26, lines 1-30).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Burrows’s teaching of index terms that

corresponding to a digit of a range number to Matsuda's system in order to identify locations of the records including portions of numeric information within the span of the range of values.

As to claim 25, Matsuda teaches the claimed limitations:

A query-encoder configured to receive a number-range search query having a boundary number," as processing a query have a condition of price >10. 10 is represented as one boundary number. The above information indicates that the system has included a query-encoder to receive the query and process the query (paragraph [0047]);

"wherein the query encoder is configured to generate an expression of numerical index terms based on the boundary number," as transforming query to an equivalence search using an inverted index generated, e.g., the exemplary query is simple query having a single search condition. For two numbers N and M, their tokens  $N_i$  and  $M_i$ , if  $N.M$  there exists, by definition, a token  $N_j$  which is greater than  $M_j$ . In this case, the transformed query has an index entry that includes attribute, token, list). The transformed query is based on number 10 (paragraph [0047, 0048, 0049], page 4, col. Right, lines 49-52),

"and wherein a respective numerical index term in the expression includes information" as each index entry includes each token associated with an indexed number, e.g., token 0001 is associated with index 5 (page 4, col. Right, lines 49-52; fig. 5);

"coupled to the query encoder configured to search a document index using the expression to identify one or more document containing numbers that satisfy the expression" as returning to the search condition, document ids are retrieved from each matching token index which results in an ID list of all documents that match those tokens (paragraph [0052]).

Matsuda does not explicitly teach the claimed limitation "an index server; indicative of an integral portion of a logarithm of the boundary number".

Burrows teaches index server (col. 3, lines 40-65; col. 4, lines 55-65). the range "57-70" can be converted to a Boolean search for the range-based metawords in the desired range. That is, search the word entries corresponding the subintervals whose concatenation exactly spans the range of the search term. If the selected metawords which exactly span the range are minimized, then the search time is also minimized since a minimum number of index stream readers need to be used. The metawords which are to be used for scanning the index are selected from the "bottom" level up. For example, the metawords 57.sub.-- 1, 58.sub.-- 2, 60.sub.-- 3, 64.sub.-- 3, 68.sub.-- 2, and 70.sub.-- 1 exactly span the range "57-70" as shown by the cross hashing (col. 26, lines 1-25).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Burrows's teaching of index server and the range "57-70" can be converted to a Boolean search for the range-based metawords in the desired range. That is, search the word entries corresponding the subintervals whose concatenation exactly spans the range of the search term. If the selected metawords

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which exactly span the range are minimized, then the search time is also minimized since a minimum number of index stream readers need to be used. The metawords which are to be used for scanning the index are selected from the "bottom" level up. For example, the metawords 57.sub.-- 1, 58.sub.-- 2, 60.sub.-- 3, 64.sub.-- 3, 68.sub.-- 2, and 70.sub.-- 1 exactly span the range "57-70" as shown by the cross hashing to Matsuda's system in order to process a query having multiple ranges more efficiently and further reduce processing time by eliminating unnecessary physical accesses of the data while executing of the query and further order to identify locations of the records including portions of numeric information within the span of the range of values.

As to claims 38, 42 and 46, Matsuda does not explicitly teach the claimed limitation "wherein the respective numerical index term in the expression corresponds to the position of the respective digit within the respective number".

Burrows teaches index terms that corresponding to the position of a digit of a range number (fig. 7, col. 26, lines 1-30).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Burrows's teaching of index terms that corresponding to the position of a digit of a range number to Matsuda's system in order to identify locations of the records including portions of numeric information within the span of the range of values.

As to claims 40, 44 and 48, Matsuda does not explicitly teach the claimed limitation " wherein a respective numerical index term in the expression includes information indicative of a mantissa of a respective number".

Burrows teaches index terms that corresponding to the position of a digit of a range number (fig. 3, 7, col. 26, lines 1-30).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Burrows's teaching of index terms that corresponding to the position of a digit of a range number to Matsuda's system in order to identify locations of the records including portions of numeric information within the span of the range of values.

9. Claims 5, 17 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda (US 2003/0225779) in view of Burrows (US 5915251) and further in view of Lewak et al (or hereinafter "Lewak") (US 6826566).

As to claims 5, 17 and 29, Matsuda does not explicitly teach the claimed limitation "wherein at least one numerical index term includes information indicative of a number type associated with a respective number range".

Lewak teaches value types includes numbers and dates (col. 12, lines 8-10).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Lewak's teaching of value types includes numbers and dates to Matsuda's system in order to allow a user to select a specific number type for searching so that the speed of query responses quickly.

10. Claims 37, 41, 45, 39, 43 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda (US 2003/0225779) in view of Burrows (US 5915251) and further in view of Beavin et al (or hereinafter "Beavin") (US 6571233).

As to claims 37, 41 and 45, Matsuda does not explicitly teach the claimed limitation "wherein a respective numerical index term in the expression represents a respective digit of a respective number in base 10". Beavin teaches decimal number 270 refers to numbers in base 10 (col. 4, lines 62-65)

I It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Beavin's teaching of decimal number 270 refers to numbers in base 10 to Matsuda's system in order to improve a query optimization that is able to process query predicates with different data types for searching/.retrieving records in a large database.

As to claims 39, 43 and 47, Matsuda does not explicitly teach the claimed limitation "wherein the integral portion of the logarithm of a respective boundary number is an integral portion of a base 10 logarithm of the respective boundary number".

Burrows teaches index server (col. 3, lines 40-65; col. 4, lines 55-65).  
the range "57-70" can be converted to a Boolean search for the range-based metawords in the desired range. That is, search the word entries corresponding the subintervals whose concatenation exactly spans the range of

the search term. If the selected metawords which exactly span the range are minimized, then the search time is also minimized since a minimum number of index stream readers need to be used. The metawords which are to be used for scanning the index are selected from the "bottom" level up. For example, the metawords 57.sub.-- 1, 58.sub.-- 2, 60.sub.-- 3, 64.sub.-- 3, 68.sub.-- 2, and 70.sub.-- 1 exactly span the range "57-70" as shown by the cross hashing (col. 26, lines 1-25).

Beavin teaches decimal number 270 refers to numbers in base 10 (col. 4, lines 62-65)

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Burrows's teaching of index server and the range "57-70" can be converted to a Boolean search for the range-based metawords in the desired range. That is, search the word entries corresponding the subintervals whose concatenation exactly spans the range of the search term. If the selected metawords which exactly span the range are minimized, then the search time is also minimized since a minimum number of index stream readers need to be used. The metawords which are to be used for scanning the index are selected from the "bottom" level up. For example, the metawords 57.sub.-- 1, 58.sub.-- 2, 60.sub.-- 3, 64.sub.-- 3, 68.sub.-- 2, and 70.sub.-- 1 exactly span the range "57-70" as shown by the cross hashing to and Beavin's teaching of decimal number 270 refers to numbers in base 10 to Matsuda's system in order to improve a query optimization that is able to process query predicates with different data types for searching/.retrieving records in a large database, process a query having multiple ranges more efficiently,

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reduce processing time by eliminating unnecessary physical accesses of the data while executing of the query and further order to identify locations of the records including portions of numeric information within the span of the range of values.



***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Antoshenkov (US 6439783).

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

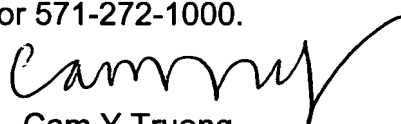
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### **Contact Information**

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cam Y T. Truong whose telephone number is (571) 272-4042. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Cam Y Truong  
Primary Examiner  
Art Unit 2162